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Nanotomographic Imaging at TOMCAT

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Synchrotron-based full-field tomographic microscopy established itself as a tool for non-invasive investigations. Many beamlines worldwide routinely achieve micrometer spatial resolution while the isotropic 100 nm barrier is reached and trespassed only by few instruments, mainly in the soft X-ray regime. We present an X-ray, full field microscope with tomographic capabilities operating at 10 keV and with a 3D isotropic resolution of 144 nm recently installed at the TOMCAT beamline of the Swiss Light Source. Custom optical components including a beamshaping condenser and phase-shifting dot arrays were used to obtain an ideal, aperture-matched sample illumination and very sensitive phase contrast imaging. The instrument has been successfully used for the non-destructive, volumetric investigation of single, unstained cells, bacteria and other biological samples. The instrument also performs well when dealing with material science specimen, like fresh cement pastes and similar.

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